



2017 Stormwater Design Manual Addendum

**(When combined with the Department of Ecology 2014
Stormwater Management Manual for Western
Washington is the adopted City of Issaquah “Stormwater
Design Manual”)**

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City of Issaquah Public Works Engineering Department

Adopted by the City Council

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ATTACHMENTS

- Attachment 1. Ordinance 2783 Adopting Stormwater Manual
- Attachment 2. IMC Chapter 16.26. Clearing, Grading and Stormwater Management
- Attachment 3. Stormwater Standard Details and Approved Materials

CHAPTER 1. INTRODUCTION

1.1 GENERAL REQUIREMENTS

The City of Issaquah adopted through Ordinance 2783 (included as Attachment 1) the Washington Department of Ecology (Ecology) 2014 Stormwater Management Manual for Western Washington (SWMMWW) for the design, construction and maintenance of stormwater management systems and facilities that are approved through the development permitting process. This document, the City of Issaquah 2016 Stormwater Design Manual Addendum (Addendum), is also adopted and in combination these two documents are referred to as the ***Stormwater Design Manual***. These requirements are codified in Issaquah Municipal Code (IMC) Chapter 16.26, Clearing, Grading, and Stormwater Management (included as Attachment 2).

The 2014 Stormwater Management Manual for Western Washington is available on Ecology's website (Ecology Publication Number 14-10-055):

<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>.

The requirements contained in this Addendum are intended to match Appendix I of the 2013-2018 NPDES Western Washington Phase II Municipal Stormwater Permit. This Addendum also contains City permit submittal, review, and approval requirements, and specific design standards and details approved by the City of Issaquah.

1.1.1 Stormwater Management Objectives

The intent of the adoption of the Stormwater Design Manual is to comply with the thresholds, definitions, minimum requirements and exceptions, adjustment and variance criteria in Appendix I of the NPDES Western Washington Phase II Municipal Stormwater Permit (Phase 2 Permit). The Phase II Permit dictates the stormwater development standards for over 80 cities and counties in Western Washington, and these standards are implemented through Ecology-approved technical guidance manuals.

1.1.2 New Requirements for 2016

In general, these are the most significant new requirements for 2016:

- New technical manual. The City adopts the Stormwater Design Manual, based on Ecology's 2014 Stormwater Management Manual for Western Washington, replacing the previously adopted 2009 King County Surface Water Design Manual.
- Elimination of the 1 acre threshold. Previously the City retained this threshold from earlier King County manuals because this was allowed by the Phase II Permit. This exemption was eliminated in Ecology's 2013-2018 Phase II Permit.
- Low Impact Development (LID). Significant changes to LID requirements were incorporated into the Phase II Permit, and are included in Minimum Requirement #5: On-Site Stormwater Management.

1.1.3 Significant Differences between Ecology and Issaquah Requirements

While most of Ecology's 2014 SWMMWW is applicable to the City of Issaquah, several significant differences are contained in this Addendum and through other City requirements for development permitting, including (but not limited to):

- Central Issaquah Area Alternative Flow Control Standard, identified in Table 1-1 and described in Section 2.2.4 and shown on Figure 2-5, modifies the flow control standard in the valley floor area of downtown Issaquah by allowing existing land use to be assumed for the pre-developed condition.
- The Central Issaquah Area Seasonally Saturated Soil Assumption can be used in valley floor areas whether site investigations demonstrate that the site contained seasonally saturated soils and thus can be modeled as wetlands (see Section 2.2.5).
- The City's turbidity standard in construction runoff is 100 NTUs up to the 10-year/24-hour storm event for all projects involving clearing and grading (see Section 1.2.5).
- The Development Services Department conducts stormwater review. Permit applications are submitted online through www.MyBuildingPermit.com (see Section 1.4.1).
- Submittal requirements specific to City of Issaquah requirements have been developed and are available on the City's website and through the online permitting portal. City of Issaquah standard details, notes and materials are also referenced (see Section 1.4.3).

1.1.4 Interpretation of Conflicting Standards

Users of this Addendum shall refer to Appendix I of the Phase II Permit, along with associated references in the SWMMWW, to help interpret the requirements of this Addendum, should any discrepancies or questions be found in this Addendum. This interpretation shall not affect City standards contained herein or in IMC Chapter 16.26 that are intended to meet the minimum requirements of the Phase II Permit.

1.1.5 Projects Vested under Previous Manuals

This manual does not impact stormwater requirements for development projects that were permitted and vested to certain standards under previously adopted King County Surface Water Design Manuals. Those projects are still able to apply those appropriately vested standards. However, submittal procedures contained in this 2016 Addendum and technical guidance contained in the Stormwater Design Manual can be used in conjunction with those earlier standards.

1.2 REQUIREMENTS

1.2.1 Screening and Project Review

Table 1-1 is a summary of the different project types requiring drainage review. This is a project screening tool that is based on Figures 2.3 and 2.4 that is used only to determine which minimum requirements a project may be subject to. The actual criteria are in the Minimum Requirements, as applied to each threshold discharge area separately (see next section).

1.2.2 Flow Control and Water Quality BMPs

The Stormwater Design Manual contains the technical guidance on measures necessary to control the quantity and quality of stormwater. This is done through application of the minimum requirements and Best Management Practices (BMPs).

Tables 1-2 and 1-3 are summaries of required flow control and water quality treatment BMP requirements. These summaries are intended to inform applicants of the major stormwater requirements to help scoping of detailed project design. Please refer to Chapter 2 of this Addendum and the Stormwater Design Manual for specific requirements for these and other minimum requirements that must be followed during design. Sites that can fully infiltrate or disperse are not required to provide additional runoff treatment or flow control facilities.

Table 1-1 PROJECT SCREENING FOR STORMWATER REVIEW							
Project Type ^b	Screening Thresholds ^a			Minimum Requirements ^a			
	Hard Surfaces		Land Clearing	MR #1-5	MR #6-9	Stormwater Facility Target Surfaces ^d	Pre-Dev Cond.
1. TESC Only	<2000 SF new plus replaced hard surfaces	or	<7000 SF land disturbance	MR #2 – Construction Stormwater Pollution Prevention Plan			
2. New Development – All projects^c	2000-5000 SF new plus replaced hard surfaces	or	7000-32,670 SF land disturbance	✓		--	--
	>5000 SF new plus replaced hard surfaces	or	>32,670 SF land disturbance	✓	✓	<u>New and replaced</u> hard surfaces	Forested
3a. Redevelopment - Value of proposed improvements is <50% of value of existing site improvements^c	2000-5000 SF new plus replaced hard surfaces	or	7000-32,670 SF land disturbance	✓		--	--
	>5000 SF new plus replaced hard surfaces	or	>32,670 SF land disturbance	✓	✓	<u>New</u> hard surfaces only	Forested
3b. Redevelopment - Value of proposed improvements is >50% of value of existing site improvements^c	2000-5000 SF new plus replaced hard surfaces	or	7000-32,670 SF land disturbance	✓		--	--
	>5000 SF new plus replaced hard surfaces	or	>32,670 SF land disturbance	✓	✓	<u>New and replaced</u> hard surfaces	Forested
4a. Transportation redevelopment - New hard surfaces add <50% to existing hard surfaces	2000-5000 SF new plus replaced hard surfaces	or	7000-32,670 SF land disturbance	✓		--	--
	>5000 SF new plus replaced hard surfaces	or	>32,670 SF land disturbance	✓	✓	<u>New</u> hard surfaces only	Forested
4b. Transportation redevelopment - New hard surfaces add >50% to existing hard surfaces	2000-5000 SF new plus replaced hard surfaces	or	7000-32,670 SF land disturbance	✓		--	--
	>5000 SF new plus replaced hard surfaces	or	>32,670 SF land disturbance	✓	✓	<u>New and replaced</u> hard surfaces	Forested
5. Central Issaquah Alternative Flow Control Area (see Figure 2-5) – All projects	2000-5000 SF new plus replaced hard surfaces	or	7000-32,670 SF land disturbance	✓		--	--
	>5000 SF new plus replaced hard surfaces	or	>32,670 SF land disturbance	✓	✓	<u>New</u> hard surfaces only	Existing

^aSee Chapter 2 for requirements, following the flow charts in Figures 2-4 and 2-4 and referring to Minimum Requirements for specific criteria.

^bSee Chapter 2.1 for additional exemptions.

^cNew Development are sites with <35% existing impervious coverage; Redevelopment are sites with >35% existing impervious coverage.

^dStormwater Facility Target Surfaces: for flow control and water quality treatment. Onsite Stormwater BMPs required under MR #5.

TABLE 1-2 REQUIREMENTS FOR WATER QUALITY (MR #6)

Thresholds	<ul style="list-style-type: none"> Required for projects with new or replaced <i>pollution generating hard surface</i> > 5000 sf and for <i>pollution generating pervious surface</i> >3/4 ac. (see Target Surface definition under project type). Oil control is required for high use sites
Standards	<ul style="list-style-type: none"> Phosphorus treatment is required for projects discharging to streams. Enhanced treatment for certain land uses and oil control for high use sites. Pretreatment or Basic treatment is required prior to infiltration.
Surfaces	Pollution generating hard surfaces and pollution generating pervious surface (e.g., landscaping, turf fields, etc.)
Facility types	See Section 1.2.2.3 and Table 1-4. Treatment systems must be sized for the entire flow draining to the facility, not just additional areas added as part of a redevelopment project.

TABLE 1-3 REQUIREMENTS FLOW CONTROL (MR #7)

Threshold	<p>Evaluate projects with >5000 sf of new and/or replaced impervious surface to determine which of these criteria apply:</p> <ul style="list-style-type: none"> All sites with <i>Total effective impervious surface</i> >10,000 sf, or >3/4 acres of vegetation converted to lawn or landscape, or Increase in the 100-year discharge compared to pre-project condition is 0.10 or 0.15 cfs (depending on WWHM model time step used). <p><i>Note: thresholds apply separately to each threshold discharge area</i></p>
Standard	Match developed discharge durations to pre-developed duration for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow (i.e., "Level 2").
Target Surfaces	See Table 1-1 for summary, as further described in Chapter 2, to determine whether target surfaces include new or new plus replaced hard surfaces.
Pre-Developed Assumption	<p>Depends on project type and location (see Fig. 2.3 and 2.4):</p> <ul style="list-style-type: none"> New Development (>35% existing impervious): Forested Redevelopment (>35% existing impervious): Existing Central Issaquah Area Alternative Flow Control Standard (new and redevelopment): Existing
Soils	<p>Soil type shall be assumed to be existing site conditions, except as follows:</p> <ul style="list-style-type: none"> <u>Saturated pre-development soils</u> can be assumed if applicants can demonstrate through a soil investigation that the site was historically (i.e., prior to European settlement) seasonally saturated.
Facility types	Flow control can be achieved through any combination of engineered facilities (e.g., stormwater pond or vault), infiltration to groundwater, and stormwater LID techniques.
Exemptions	Direct discharge to Lake Sammamish is exempt from flow control requirements, assuming the conveyance system is designed to accommodate the design peak discharge under full build-out condition for the local drainage area.

1.2.2.1 Hydrologic Analysis (Approved Model)

The Approved Model for hydrologic analysis is the Western Washington Hydrology Model (WWHM2012 or subsequent versions). This software can be obtained at this Ecology website:

<http://www.ecy.wa.gov/programs/wq/stormwater/wwhmtraining/index.html>

Commercial versions of WWHM, obtained through Clear Creek Solutions, are also accepted and provide added functionality compared to the public domain WWHM version.

1.2.2.2 Hydraulic Analysis and Conveyance System Design

Small projects generally do not require hydraulic analysis of pipe systems. For larger projects the hydraulic analysis procedures contained in the Stormwater Design Manual must be followed.

Regardless of whether hydraulic modeling is needed, conveyance systems must be design in accordance with the criteria in Stormwater Design Manual. City of Issaquah Standard Details for materials and construction must be followed for facilities to be owned and maintained by the City. All facilities shall be designed to be accessible for inspection and maintenance (e.g., access roads).

1.2.2.3 Water Quality Treatment Options

Table 1-4 summarizes water quality treatment options. Water quality treatment devices approved by Ecology under the Technology Assessment Protocol - Ecology (TAPE) program are approved for use in the City of Issaquah. In addition:

- All discharges to streams shall assume phosphorus treatment.
- Facilities to be dedicated to be owned and maintained by the City must be on Approved Materials List.
- Only General Use Level Designation (GULD) treatment technologies are allowed. In cases where GULD approval is imminent from Ecology, or the device will be used in a retrofit project not subject to development regulations, the City may conditionally allow Conditional Use Level Designation (CULD) devices if allowed by the manufacturer.
- All TAPE-approved treatment devices must be selected in accordance with their intended use: pretreatment, oil treatment, basic treatment, enhanced treatment, phosphorus treatment, and construction sites. Design must follow the TAPE approvals

for pretreatment, hydraulic profile, design treatment flow rates, flow bypass, and other criteria.

Table 1-4 lists GULD-approved technologies for pre-treatment, basic, enhance, and phosphorus treatment. This list is also contained in the Approved Materials List and will be updated periodically. Basic treatment and pre-treatment is used prior to infiltration or as part of treatment train (see design manual).

TABLE 1-4 WATER QUALITY TREATMENT OPTIONS				
Product	Pre-Treat	Basic	Enhanced	Phosp.
EMERGING TECHNOLOGIES				
AquaShield Aqua-Swirl System	X			
Baysaver BayFilter®		X		
Contech CDS™ Stormwater Treatment System	X			
WSDOT Compost-Amended Biofiltration Swale		X	X	
Hydro International Downstream Defender	X			
Watertechtonics ecoStorm plus		X		
Contech Filterra® Bioscape™		X	X	X
Contech Filterra® System		X	X	X
Oldcastle FloGard Perk Filter®		X		X
WSDOT Media Filter Drain		X	X	X
Contech Media Filtration System		X		
Bio Clean Environmental MWS-Linear Modular Wetland		X	X	X
Imbrium Systems Stormceptor	X			
Contech StormFilter -PhosphoSorb Media at 1.67 gpm/sq ft		X		X
Contech Stormfilter using ZPG Media		X		
Contech Vortechs System	X			
STORMWATER DESIGN MANUAL				
Infiltration (with pretreatment)		X	X	X
Large sand filter ¹		X	X	X
Large wet pond		X		X
Two-facility treatment train (see manual) ²		X	X	X

¹Private development only. Sand filters not accepted as a City-owned facility.

²Requires basic or linear sand filter as part of the treatment train, also not accepted as a City-owned facility.

1.2.3 On-Site Stormwater BMPs (Low Impact Development BMPs)

On-site stormwater management BMPs (SWMMWW Minimum Requirement #5), also known as stormwater Low Impact Development (LID), provide for stormwater treatment and flow control using methods that infiltrate, disperse, and retain stormwater runoff on-site. The requirement for Stormwater LID is in addition to conventional stormwater detention and treatment facilities. However, if designed appropriately and used extensively, stormwater LID can reduce the size or potentially eliminate the need for those conventional facilities.

Stormwater LID is defined by Ecology as a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design. Examples of stormwater LID include flow dispersion, bioretention, rain gardens, and permeable pavement.

Stormwater LID is required where found to be feasible for each of these three categories of stormwater runoff as summarized in Table 1-5. Each of the three surfaces is evaluated separately for LID feasibility, with the first techniques in each list that is found to be feasible must be implemented. Multiple BMPs may be required, such as a combination of full dispersion and rain gardens, to meet the full on-site stormwater BMP. If no LID technique is feasible, either singularly or in combination, then no LID is required for that category.

This analysis requires an in-depth analysis of site conditions in terms of onsite characteristics: soil, depth to seasonally high groundwater, geology and slope stability, topography, and others. Certain offsite characteristics also need evaluation, such as location of adjacent structures that could be adversely affected. Feasibility shall be determined by evaluation against:

1. Design criteria, limitations and infeasibility criteria identified for each on-site stormwater management BMP in Chapter 5 Volume V of the Stormwater Design Manual; and
2. Competing needs criteria listed in Chapter 5 Volume V of the Stormwater Design Manual.

TABLE 1-5 REQUIREMENTS FOR ON-SITE STORMWATER BMPs (MR#5)

Surface	How Evaluated	BMPs to be Evaluated for Feasibility		General Criteria ^a
		Projects that trigger MR#1-MR#5	Projects that Trigger MR#6-MR#9	
Lawn/ Landscaped Areas	Required in all projects.	1. Post-Construction Soil Quality and Depth (BMP T5.13; IMC 18.12.140)		De-compact and add topsoil meeting pH and organic criteria to depth of 8 inches.
Roofs	Use BMPs that are determined to be feasible, evaluated in order listed, until full BMP criteria is met.	2a. Full Dispersion (BMP T5.30), <u>or</u> Downspout Full Infiltration Systems (BMP T5.10A).		Full dispersion requires large native growth area: 6.5 times area of roof draining to it. Downspout infiltration requires less area but is subject to soil conditions.
		2b. Rain Gardens (BMP T5.14A), <u>or</u> Bioretention.	Same as MR#1-MR#5 except Bioretention in place of rain gardens.	Area of rain garden or bioretention to be 5% of roof area draining to it, at depth of 6-12 inches. Bioretention adds engineering criteria on design infiltration rate.
		2c. Downspout Dispersion Systems (BMP T5.10B)		Used if dispersion area is moderate (25-50 ft length) using splash blocks or gravel-filled trenches
		2d. Perforated Stub-out Connections (BMP T5.10C)		Used if dispersion area is minimal (<25 ft length) using perforated pipe in 24" wide gravel trench
Other Hard Surfaces (e.g., parking lots, sidewalks)	Use BMPs that are determined to be feasible, evaluated in order listed, until full BMP criteria is met.	3a. Full Dispersion (BMP T5.30)		Full Dispersion: see #2a above.
		3b. Permeable pavement (BMP T5.15), <u>or</u> Rain Gardens (BMP T5.14A)	Same as MR#1-MR#5 except Bioretention in place of rain gardens.	Permeable pavement: All surfaces, except high use, roads >400 ADT, and other infeasibility criteria. Rain gardens/bioretention: see #2b above.
		3c. Sheet Flow Dispersion (BMP T5.12), or Concentrated Flow Dispersion (BMP T5.11)		Sheet flow: min 10 ft or larger vegetated buffer next to parking lot or road. Concentrated flow dispersion requires 50 ft flow path and is limited to 700 sf of hard surface.

^a This is a generalized summary only, and does not reflect the BMP infeasibility criteria or competing needs assessment that may apply to the project and site. See BMP sheets in Ecology Manual for complete criteria.

1.2.4 Source Control BMPs

Stormwater source control BMPs (SWMMWW Minimum Requirement #3) focus on preventing stormwater pollution from occurring at its source, as opposed to treatment BMPs that attempt to reduce pollution in stormwater flows after the water is contaminated (i.e., "end of pipe" treatment).

Source control BMPs cover a wide spectrum of activities, both structural and operational that are applied to the entire site to reduce or prevent pollution in stormwater. These measures address pollution prevention at their source, by using practices such as specific design requirements to prevent non-stormwater discharges from entering the stormwater drainage system, good housekeeping, spill prevention, hazardous material containment, and pre-treatment measures.

All projects (but typically commercial, industrial, and multifamily) undergoing drainage review are required to implement applicable source controls. The City may, however, require mandatory source controls at any time through formal code enforcement if complaints, inspections, or studies reveal water quality violations.

Common source control BMPs that are typically required on new and re-development sites include:

- Enclosing and or covering the pollutant source
- Design of dumpster enclosures with no connection to storm drains
- Connecting trash compactors to sewer
- Connection of interior (including garage) floor drains to sewer
- Covering of storage and operational areas within the site containing or handling potentially deleterious materials
- Physically segregating the pollutant source to prevent run-on of uncontaminated stormwater (berming, cover, sewer connections).
- Car or equipment washing areas connected to sewer.

A full list of source control BMPs are contained in Stormwater Design Manual Volume IV Source Control BMPs.

1.2.5 Construction Stormwater BMPs

Construction stormwater BMPs (SWMMWW Minimum Requirement #2) are required for all proposed projects that clear, grade, or otherwise disturb the site. Erosion and sediment

controls must be provided to prevent, to the maximum extent practicable, the transport of sediment and other pollutants from the project site to downstream drainage facilities, water resources, and adjacent properties. Referred to as Temporary Erosion and Sediment Control (TESC), this is required even if no permanent stormwater facilities are required or proposed.

The City TESC program differs from the Stormwater Design Manual and the Ecology Construction Stormwater General Permit in the following ways:

- TESC plan review is required even if the applicant is also required to obtain an Ecology Construction Stormwater General Permit.
- Discharge from the project site shall not exceed 100 NTUs (nephelometric turbidity units) at all times up to the 10 year/24 hour storm event (3.5 inches in 24 hours) as measured at the City's rain gage.
- City of Issaquah staff will conduct monitoring to verify compliance.
- Updates to the TESC plan are required if the project construction or other circumstances cause changes to the TESC facilities or strategies to meet the requirements herein.
- The City may issue a Stop Work Order and/or a civil penalty under Code Enforcement..

See IMC Chapter 16.26 for specific clearing and grading and TESC standards.

1.2.6 Retrofit Projects

In retrofit situations where the requirements of this Addendum and IMC 16.26 are not triggered, use of Ecology-approved emerging technology BMPs for water quality treatment are encouraged, but not required. New technologies for water quality treatment that are not yet approved by Ecology may be used with prior approval by the City. The request should include information that the proposed treatment device is effective in reducing pollutants from stormwater. The applicant, however, should recognize that subsequent redevelopment that triggers current or future water quality treatment requirements may require modification or replacement of the installed BMP with an Ecology-approved BMP.

1.3 STORMWATER SITE DESIGN TO CONFORM WITH LAND USE CODES AND ADOPTED PLANS

1.3.1 Competing Needs Assessment

Ecology allows certain exemptions to the On-site stormwater management BMPs (SWMMWW Minimum Requirement #5) if there are competing needs at the development site. Competing

Needs criteria are contained in Chapter 5.3.1 of Volume V of the SWMMWW. The On-site Stormwater Management BMPs can be superseded or restricted where they are in conflict with:

- Requirements of the following federal or state laws, rules, and standards: Historic Preservation Laws and Archaeology Laws, Federal Superfund or Washington State Model Toxics Control Act, Federal Aviation Administration requirements for airports, Americans with Disabilities Act.
- Where an LID requirement has been found to be in conflict with special zoning district design criteria adopted and being implemented pursuant to a community planning process, the existing local codes may supersede or reduce the LID requirement.
- Public health and safety standards.
- Transportation regulations to maintain the option for future expansion or multi-modal use of public rights-of-way.
- A local Critical Area Ordinance that provides protection of tree species.
- A local code or rule adopted as part of a Wellhead Protection Program established under the Federal Safe Drinking Water Act; or adopted to protect a Critical Aquifer Recharge Area established under the State Growth Management Act.

This assessment will be addressed during the land use permit process, prior to drainage review, following adopted City codes and policies.

1.3.2 Other Design Considerations

Stormwater site design must be initiated at the project conceptual design stage so that required stormwater facilities not only function given site topography and discharge points, but also to ensure these facilities integrate with land use codes. This evaluation occurs during the land use review and permitting phase. Stormwater LID is part of overall green infrastructure goals that are promoted by the City of Issaquah.

Ideally the two largely independent requirements of stormwater mitigation (both structural and LID) and land use design will be combined using an integrated approach to achieve green infrastructure goals. As an incentive, when stormwater low impact development principles are employed it can reduce the volume of stormwater that requires conveyance and treatment through conventional means, such as detention ponds. Such benefits can reduce site development costs.

1.4 OVERVIEW OF PERMIT SUBMITTAL REQUIREMENTS

1.4.1 Development Review Process

The Development Services Department (DSD) oversees and manages permit intake, review, tracking, and approval. The Permit Center, located within DSD at City Hall Northwest, provides general information for construction in the City limits. Construction permits assure that structures are built to nationally-recognized standards, as well as designed to ensure that buildings are structurally sound and hazard free. Land use permits assure that structures meet zoning requirements and comply with environmental regulations.

The City of Issaquah accepts most permit types online through www.MyBuildingPermit.com. This system allows you to submit the application, upload required documents, download comments, send revisions and receive approved plans. Please verify the following before applying online:

- Contact the Permit Center before apply for a construction permit online. A pre-submittal meeting may be required so staff can preliminarily scope your project for any additional requirements.
- Verify you have access to all your submittal documents in a clean pdf format. If your plan set is being drawn by multiple sources make sure you are able to combine them into one pdf file (plumbing, mechanical, civil etc).

1.4.2 Submittal Requirements

The Development Services Department specifies what submittal and application materials are required for a complete application, including the type of submittals, the required level of detail, the minimum qualifications of preparers of technical documents, and the number of copies that must be submitted. These submittal requirements can be obtained from the Permit Center, the City's website, or via the City's online permit submittal portal www.MyBuildingPermit.com.

For stormwater review, including temporary erosion and sediment control, Minimum Requirement #1 requires preparation of a stormwater site plan called a Technical Information Report (TIR). The content of this plan is detailed in Chapter 3 of Volume 1 of the Stormwater Design Manual, the content of which is dependent on which minimum requirements are triggered. The TIR must include the following chapters:

- a. Project Overview

- b. Existing Conditions Summary and Site Analysis
- c. Off-site Analysis Report
- d. Permanent Stormwater Control Plan (flow control, LID, and water quality facility and analysis and design)
- e. Construction Stormwater Pollution Prevention Plan (SWPPP)
- f. Special Reports and Studies
- g. Other Permits
- h. Operation and Maintenance Manual
- i. Declaration of Covenant or Easement for Privately Maintained Flow Control and Treatment Facilities
- j. Declaration of Covenant or Easement for Privately Maintained On-site Stormwater Management Facilities
- k. Bond Quantities Worksheet

1.4.3 Small Site vs. Large Site Review

Project documentation in the Technical Information Report fall under two types: small site and large site. A Small Site TIR would apply to a project meeting the requirements of MR#1-5, and a Large Site TIR would apply to a project meeting the requirements of MR#1-9.

See submittal requirements for more information.

1.4.4 City of Issaquah Standard Details, Plan Notes, and Approved Materials

All designs and materials shall follow approved guidance contained in City of Issaquah standard details and the Ecology Stormwater Manual. These standards apply to both publicly and privately owned facilities.

Standard details for stormwater construction are included in Attachment 3. These, along with the Approved Materials List and standard plan notes, are available from the Public Works Engineering Department and from the City's website:

<http://issaquahwa.gov/standards>

The City of Issaquah adopts the most recent WSDOT Standard Specifications for Road, Bridge, and Municipal Construction. Materials, joints and protective treatments shall be accordance with WSDOT/APWA 7-04 and 9-05.

1.4.5 Drainage Tracts, Easements and Covenants

1.4.5.1 Public Facilities

Flow control and water quality facilities and flow control BMP devices to be maintained and operated by the City (e.g., single family residential developments) must be located in a tract or right-of-way dedicated to the City of Issaquah. ***Drainage Easements*** are required for drainage facilities that will be operated and maintained by the City of Issaquah but are located on private property. Access roads serving these facilities must be located in the tract or right-of-way and must be connected to an improved public road right-of-way. Underground flow control or water quality facilities (tanks or vaults) may be allowed in private rights-of-way or roads if the easement includes provisions for facility access and maintenance. Applicants shall record the drainage easement against the property prior to final inspection and approval of drainage facilities, using accepted form that are reviewed and approved by the City.

In addition, required vegetated flow paths for full dispersion and basic dispersion BMPs that are located outside of the tract or right-of-way require a recorded ***declaration of covenant and drainage easement*** that stipulates restrictions on use and includes provisions for access and maintenance. City maintenance of these vegetated flow paths will be limited to their flow control BMP functionality. All other maintenance shall remain the responsibility of the owner(s).

1.4.5.2 Private Facilities

Flow Control and Water Quality Treatment BMPs

To ensure future maintenance and City inspection of flow control and water quality treatment BMPs that will be privately maintained (e.g., commercial and multi-family development projects), a ***Declaration of Covenant for Maintenance and Inspection of Stormwater Facilities and BMPs*** shall be recorded against the property prior to final inspection and approval of drainage facilities. The declaration of covenant is designed to achieve the following:

- a) Provide notice to current and future owners of the presence of the stormwater facility
- b) Include a reference to the City's permit number for the project, under which the City maintains a permanent record drawing of the constructed facility.
- c) Require that all stormwater facilities be operated and maintained at the owner's expense in accordance with the original permitted design and in accordance with maintenance standards as adopted by the City in IMC 13.28.100.

- d) Grant the City the right to enter the property at reasonable times for purposes of inspecting the stormwater facility and to perform any corrective maintenance and repair that has not been performed by the property owner within a reasonable time set by the City, and to charge the property owner for the cost of any maintenance and repair work performed by the City.
- e) Prohibit any modification or removal of the drainage facility without written approval from the City.

All stormwater facilities shall be accessible for inspection and maintenance. The Operations and Maintenance Manual for the facility shall identify maintenance requirements and equipment and access required to achieve proper maintenance.

In addition, wherever a flow control or water quality treatment facility is located on a parcel separate from the development that is generating the stormwater, provisions shall be made to ensure that the owners of the development have a perpetual right to own and maintain the stormwater facilities and associated stormwater conveyance lines in the separate parcel(s). This can be done through a ***Grant of Easement***, which shall be recorded against the property prior to final inspection and approval of drainage facilities

Onsite Stormwater BMPs

To ensure future maintenance and City inspection of Onsite Stormwater BMPs located on private property, a ***Declaration of Covenant for Maintenance and Inspection of Onsite Stormwater BMP*** shall be recorded for each site/lot that contains an Onsite Stormwater BMP prior to final inspection and approval. The declaration of covenant is designed to achieve the following:

- a) Provide notice to current and future owners of the presence of Onsite Stormwater BMPs on the lot and the responsibility of the owner to retain, uphold, and protect the flow control BMP devices, features, pathways, limits, and restrictions.
- b) Include as an exhibit, a recordable version of the following information: The Onsite Stormwater BMP site plan showing all developed surfaces (impervious and pervious) and the location and dimensions of flow control BMP devices, features, flowpaths (if applicable), and limits of native growth retention areas (if applicable).
- c) Require that each Onsite Stormwater BMP be operated and maintained at the owner's expense in accordance with the above exhibit.
- d) Grant the City the right to enter the property at reasonable times for purposes of inspecting the flow control BMPs and to perform any corrective maintenance, repair, restoration, or mitigation work on the Onsite Stormwater BMP that has not been performed by the property owner within a reasonable time set by the City, and to

charge the property owner for the cost of any maintenance, repair, restoration, or mitigation work performed by the City.

- e) Prohibit any modification or removal of Onsite Stormwater BMPs without written approval from the City.

1.4.6 City Acceptance of Public Drainage Facilities

IMC 13.28.080 provides criteria for accepting drainage facilities after the expiration of the 2-year maintenance period in connection with the subdivision of land:

- Requirements of IMC 13.28.070 regarding bonding and insurance during the 2-year maintenance period have been fully complied with;
- The facilities have been inspected and approved by the Department after their second year of operation; and
- All necessary easements or dedications entitling the City to properly maintain the facility have been conveyed to the City.
- Signage indicating “stormwater facility”. Signage shall be required to identify permeable pavement, bioretention, or rain gardens as designed and maintained stormwater facility.

1.4.7 Other Standards Affecting Stormwater Design

Table 1-6 summarizes other requirements that typically affect development site and drainage design. Other code requirements not identified may also apply, and will be identified during the pre-application process and subsequent permit review. The engineer/architect should become familiar with these and other requirements and incorporate them into their drainage design as necessary. Questions regarding these requirements shall be directed to the Department listed in Table 1-6.

TABLE 1-6 OTHER REQUIREMENTS AFFECTING DRAINAGE DESIGN		
Subject	Requirement	Reference
City of Issaquah Development Services Department		
Impervious Surface Limits	Limits on site impervious surface area per Land Use Code	IMC18.07.360 (District Standards Table)
Landscape Code	Soil porosity and amendments in landscaping	IMC 18.12.140(P) and (Q)
Landscape Code	No impervious surfaces within the area defined by the drip line of any trees to be retained.	IMC 18.12.140(N)(4)(c)
Critical Areas and Associated Buffers	Allowable uses, including stormwater facilities, in stream and wetland buffers	IMC 18.10.610 (wetlands) IMC 18.10.775 (streams)
Shorelines	Allowable uses, including stormwater facilities, in Shoreline buffer	IMC 18.10.940 (adopted Shoreline Plan)
Transfer of Development Rights (TDR) Program	Reduction in impervious surface areas along stream corridors (sending sites), in exchange for greater density in growth areas (receiving sites)	IMC 18.10.2050(A)(3)
Transfer of Development Rights (TDR) Program	Additional impervious surface area credit for using LID at receiving sites located in the CARA	IMC 18.10.2040(A)(3)(c)
City of Issaquah Public Works Engineering Department		
Flood Hazard Code	Development within designated areas of special flood hazard, including no net fill and no blockage of floodwaters.	IMC 16.36
Critical Aquifer Recharge Area (CARA code)	Hazardous waste management requirements within wellhead protection areas (CARA Class 1 and 2)	IMC 18.10.796 and IMC 13.29
State Department of Ecology		
Underground Injection Control (UIC)	Stormwater infiltration facilities meeting the definition of a UIC well must be registered with Ecology and meet Ecology treatment criteria.	Department of Ecology
NPDES Construction Stormwater Permit	Construction sites over 1.0 acre must obtain Department of Ecology construction stormwater general permit	Department of Ecology

CHAPTER 2. MINIMUM REQUIREMENTS FOR NEW DEVELOPMENT AND REDEVELOPMENT

2.1 EXEMPTIONS

Unless otherwise indicated in this Section, the practices described in this section are exempt from the Minimum Requirements, even if such practices meet the definition of new development or redevelopment.

2.1.1 Forest Practices

Forest practices regulated under Title 222 WAC, except for Class IV General forest practices that are conversions from timberland to other uses, are exempt from the provisions of the minimum requirements.

2.1.2 Pavement Maintenance

The following pavement maintenance practices are exempt: pothole and square cut patching, overlaying existing asphalt or concrete pavement with asphalt or concrete without expanding the area of coverage, shoulder grading, reshaping/regrading drainage systems, crack sealing, resurfacing with in-kind material without expanding the road prism, pavement preservation activities that do not expand the road prism, and vegetation maintenance.

The following pavement maintenance practices are not categorically exempt. The extent to which this Appendix applies is explained for each circumstance.

- Removing and replacing a paved surface to base course or lower, or repairing the pavement base: If impervious surfaces are not expanded, Minimum Requirements #1 - #5 apply.
- Extending the pavement edge without increasing the size of the road prism, or paving graveled shoulders: These are considered new impervious surfaces and are subject to the minimum requirements that are triggered when the thresholds identified for new or redevelopment projects are met.
- Resurfacing by upgrading from dirt to gravel, asphalt, or concrete; upgrading from gravel to asphalt, or concrete; or upgrading from a bituminous surface treatment ("chip seal") to asphalt or concrete: These are considered new impervious surfaces and are subject to the minimum requirements that are triggered when the thresholds identified for new or redevelopment projects are met.

2.1.3 Underground Utility Projects

Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics are only subject to Minimum Requirement #2, Construction Stormwater Pollution Prevention.

2.2 DEFINITIONS RELATED TO MINIMUM REQUIREMENTS

(Note: See also definitions contained in IMC 16.26 and the SWMMWW).

Arterial – A road or street primarily for through traffic. The term generally includes roads or streets considered collectors. It does not include local access roads which are generally limited to providing access to abutting property. See also [RCW 35.78.010](#), [RCW 36.86.070](#), and [RCW 47.05.021](#).

Bioretention – Engineered facilities that treat stormwater by passing it through a specified soil profile, and either retain or detain the treated stormwater for flow attenuation. Refer to the *Stormwater Management Manual for Western Washington (SWMMWW)*, Chapter 7 of Volume V for Bioretention BMP types and design specifications.

Certified Erosion and Sediment Control Lead (CESCL) – means an individual who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by the Washington Department of Ecology (Ecology) (see BMP C160 in the *Stormwater Management Manual for Western Washington (SWMMWW)*). A CESCL is knowledgeable in the principles and practices of erosion and sediment control. The CESCL must have the skills to assess site conditions and construction activities that could impact the quality of stormwater and, the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges. Certification is obtained through an Ecology approved erosion and sediment control course. Course listings are provided online at Ecology's website.

Commercial Agriculture – means those activities conducted on lands defined in RCW 84.34.020(2) and activities involved in the production of crops or livestock for commercial trade. An activity ceases to be considered commercial agriculture when the area on which it is conducted is proposed for conversion to a nonagricultural use or has lain idle for more than five years, unless the idle land is registered in a federal or state soils conservation program, or unless the activity is maintenance of irrigation ditches, laterals, canals, or drainage ditches related to an existing and ongoing agricultural activity.

Converted vegetation (areas) – The surfaces on a project site where native vegetation, pasture, scrub/shrub, or unmaintained non-native vegetation (e.g., Himalayan blackberry, scotch broom) are converted to lawn or landscaped areas, or where native vegetation is converted to pasture.

Discharge Point – the location where a discharge leaves the Permittee’s MS4 through the Permittee’s MS4 facilities/BMPs designed to infiltrate.

Effective Impervious surface – Those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. Impervious surfaces are considered ineffective if: 1) the runoff is dispersed through at least one hundred feet of native vegetation in accordance with BMP T5.30 – “Full Dispersion” as described in Chapter 5 of Volume V of the *Stormwater Management Manual for Western Washington (SWMMWW)*; 2) residential roof runoff is infiltrated in accordance with Downspout Full Infiltration Systems in BMP T5.10A in Volume III of the *SWMMWW*; or 3) approved continuous runoff modeling methods indicate that the entire runoff file is infiltrated.

Erodible or leachable materials – Wastes, chemicals, or other substances that measurably alter the physical or chemical characteristics of runoff when exposed to rainfall. Examples include erodible soils that are stockpiled, uncovered process wastes, manure, fertilizers, oily substances, ashes, kiln dust, and garbage dumpster leakage.

Hard Surface – An impervious surface, a permeable pavement, or a vegetated roof.

Highway – A main public road connecting towns and cities

Impervious surface – A non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.

Land disturbing activity – Any activity that results in a change in the existing soil cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities

include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices, including landscape maintenance and gardening, are not considered land-disturbing activity. Stormwater facility maintenance is not considered land disturbing activity if conducted according to established standards and procedures.

Low Impact Development (LID) – A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design.

LID Best Management Practices – Distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration. LID BMPs include, but are not limited to, bioretention, rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use.

LID Principles – Land use management strategies that emphasize conservation, use of on-site natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff.

Maintenance – Repair and maintenance includes activities conducted on currently serviceable structures, facilities, and equipment that involves no expansion or use beyond that previously existing and results in no significant adverse hydrologic impact. It includes those usual activities taken to prevent a decline, lapse, or cessation in the use of structures and systems. Those usual activities may include replacement of dysfunctional facilities, including cases where environmental permits require replacing an existing structure with a different type structure, as long as the functioning characteristics of the original structure are not changed. One example is the replacement of a collapsed, fish blocking, round culvert with a new box culvert under the same span, or width, of roadway. In regard to stormwater facilities, maintenance includes assessment to ensure ongoing proper operation, removal of built up pollutants (i.e. sediments), replacement of failed or failing treatment media, and other actions taken to correct defects as identified in the maintenance standards of Chapter 4, Volume V of the *Stormwater Management Manual for Western Washington (SWMMWW)*. See also Pavement Maintenance exemptions in Section 1 of this Appendix.

Native vegetation – Vegetation comprised of plant species, other than noxious weeds, that are indigenous to the coastal region of the Pacific Northwest and which reasonably could have

been expected to naturally occur on the site. Examples include trees such as Douglas Fir, western hemlock, western red cedar, alder, big-leaf maple, and vine maple; shrubs such as willow, elderberry, salmonberry, and salal; and herbaceous plants such as sword fern, foam flower, and fireweed.

New development – Land disturbing activities, including Class IV -general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of hard surfaces; and subdivision, short subdivision and binding site plans, as defined and applied in Chapter 58.17 RCW. Projects meeting the definition of redevelopment shall not be considered new development.

Outfall – a point source as defined by 40 CFR 122.2 at the point where a discharge leaves the permittee's MS4 and enters a surface receiving waterbody or surface receiving waters. Outfall does not include pipes, tunnels, or other conveyances which connect segments of the same stream or other surface waters and are used to convey primarily surface waters (i.e., culverts).

On-site Stormwater Management BMPs (aka Onsite Stormwater BMP): As used in this appendix, a synonym for Low Impact Development BMPs.

Permeable pavement – Pervious concrete, porous asphalt, permeable pavers or other forms of pervious or porous paving material intended to allow passage of water through the pavement section. It often includes an aggregate base that provides structural support and acts as a stormwater reservoir.

Pervious Surface – Any surface material that allows stormwater to infiltrate into the ground. Examples include lawn, landscape, pasture, native vegetation areas, and permeable pavements.

Pollution-generating hard surface (PGHS) – Those hard surfaces considered to be a significant source of pollutants in stormwater runoff. See the listing of surfaces under pollution-generating impervious surface.

Pollution-generating impervious surface (PGIS) – Those impervious surfaces considered to be a significant source of pollutants in stormwater runoff. Such surfaces include those which are subject to: vehicular use; industrial activities (as further defined in the glossary of the *Stormwater Management Manual for Western Washington* (SWMMWW)); storage of erodible or leachable materials, wastes, or chemicals, and which receive direct rainfall or the run-on or blow-in of rainfall; metal roofs unless they are coated with an inert, non-leachable material (e.g., baked-on enamel coating); or roofs that are subject to venting significant amounts of dusts, mists, or fumes from manufacturing, commercial, or other indoor activities.

Pollution-generating pervious surfaces (PGPS) – Any non-impervious surface subject to vehicular use, industrial activities (as further defined in the glossary of the *Stormwater Management Manual for Western Washington (SWMMWW)*); or storage of erodible or leachable materials, wastes, or chemicals, and that receive direct rainfall or run-on or blow-in of rainfall, use of pesticides and fertilizers, or loss of soil. Typical PGPS include permeable pavement subject to vehicular use, lawns, and landscaped areas including: golf courses, parks, cemeteries, and sports fields (natural and artificial turf).

Pre-developed condition – The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The pre-developed condition shall be assumed to be a forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement.

Project site – That portion of a property, properties, or right of way subject to land disturbing activities, new hard surfaces, or replaced hard surfaces.

Rain Garden – A non-engineered shallow landscaped depression, with compost-amended native soils and adapted plants. The depression is designed to pond and temporarily store stormwater runoff from adjacent areas, and to allow stormwater to pass through the amended soil profile.

Receiving waterbody or Receiving waters – naturally and/or reconstructed naturally occurring surface water bodies, such as creeks, streams, rivers, lakes, wetlands, estuaries, and marine waters, or groundwater, to which a MS4 discharges.

Redevelopment – On a site that is already substantially developed (i.e., has 35% or more of existing hard surface coverage), the creation or addition of hard surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of hard surface that is not part of a routine maintenance activity; and land disturbing activities.

Replaced hard surface – For structures, the removal and replacement of hard surfaces down to the foundation. For other hard surfaces, the removal down to bare soil or base course and replacement.

Replaced impervious surface – For structures, the removal and replacement of impervious surfaces down to the foundation. For other impervious surfaces, the removal down to bare soil or base course and replacement.

Site – The area defined by the legal boundaries of a parcel or parcels of land that is (are) subject to new development or redevelopment. For road projects, the length of the project site and the right-of-way boundaries define the site.

Source control BMP – A structure or operation that is intended to prevent pollutants from coming into contact with stormwater through physical separation of areas or careful management of activities that are sources of pollutants. The *Stormwater Management Manual for Western Washington* (SWMMWW) separates source control BMPs into two types. *Structural Source Control BMPs* are physical, structural, or mechanical devices, or facilities that are intended to prevent pollutants from entering stormwater. *Operational BMPs* are non-structural practices that prevent or reduce pollutants from entering stormwater. See Volume IV of the SWMMWW or the King County Stormwater Pollution Control Manual for details.

Stormwater Facility – A constructed component of a stormwater drainage system, designed or constructed to perform a particular function, or multiple functions. Stormwater facilities include, but are not limited to, pipes, swales, ditches, culverts, street gutters, detention ponds, retention ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators, and biofiltration swales.

Stormwater Site Plan (also known as a Technical Information Report) – A comprehensive report containing all of the technical information and analysis necessary for regulatory agencies to evaluate proposed new development or redevelopment project for compliance with stormwater requirements. Contents of the Stormwater Site Plan will vary with the types and size of the project, and individual site characteristics. It includes a Construction Stormwater Pollution Prevention Plan and Permanent Stormwater Control Plan. Elements included in preparing a Stormwater Site Plan is contained in Chapter 3 Volume 1 of the SWMMWW.

Threshold Discharge Area – An on-site area draining to a single natural discharge location or multiple natural discharge locations that combine within one-quarter mile downstream (as determined by the shortest flowpath). The examples in Figure 2.1 below illustrate this definition. The purpose of this definition is to clarify how the thresholds of this appendix are applied to project sites with multiple discharge points.

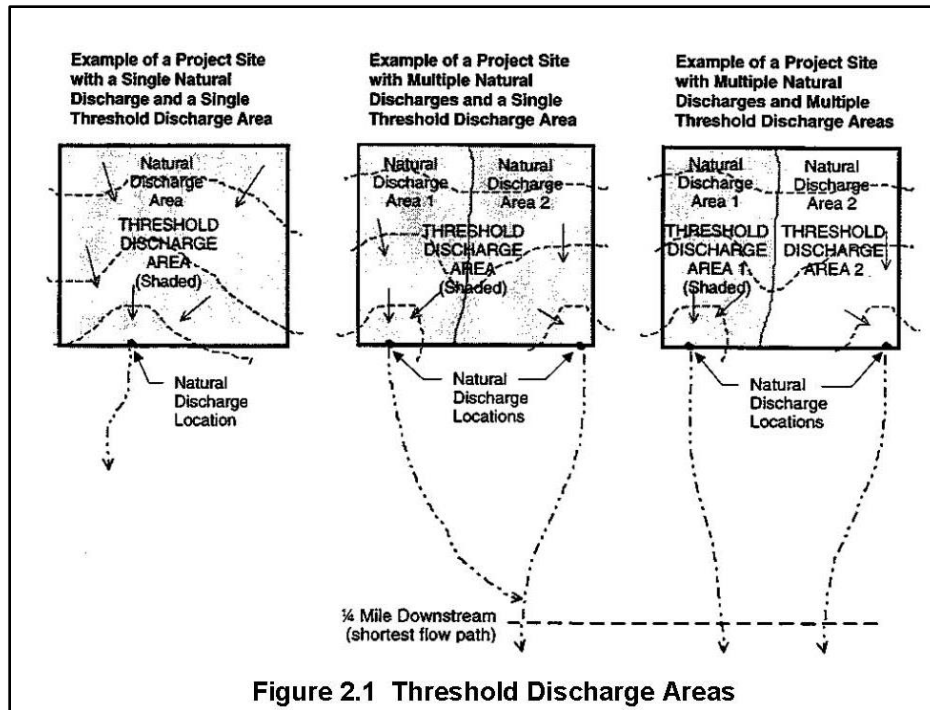


Figure 2.1 Threshold Discharge Areas

Vehicular Use – Regular use of an impervious or pervious surface by motor vehicles. The following are subject to regular vehicular use: roads, un-vegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unrestricted access fire lanes, vehicular equipment storage yards, and airport runways.

The following are not considered subject to regular vehicular use: paved bicycle pathways separated from and not subject to drainage from roads for motor vehicles, restricted access fire lanes, and infrequently used maintenance access roads.

Wetland – Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.

2.3 APPLICABILITY OF THE MINIMUM REQUIREMENTS

2.3.1 Thresholds

Not all of the Minimum Requirements apply to every development or redevelopment project. The applicability varies depending on the project type and size. This section identifies thresholds that determine the applicability of the Minimum Requirements to projects. Use the flow charts in Figures 2.2, 2.3, and 2.4 to determine which of the Minimum Requirements apply. The Minimum Requirements themselves are presented in Section 3.

Use the thresholds in sections 2.3 and 2.4 at the time of application for a subdivision, plat, short plat, building permit, or other construction permit. The plat or short plat approval shall identify all stormwater BMPs that are required for each lot. For projects involving only land disturbing activities, (e.g., clearing or grading), the thresholds apply at the time of application for the permit allowing or authorizing that activity. Note the exemption in Section 2.1 for forest practices other than Class IV General.

Figure 2.2. Flow Chart for Determining Whether Site is Regulated

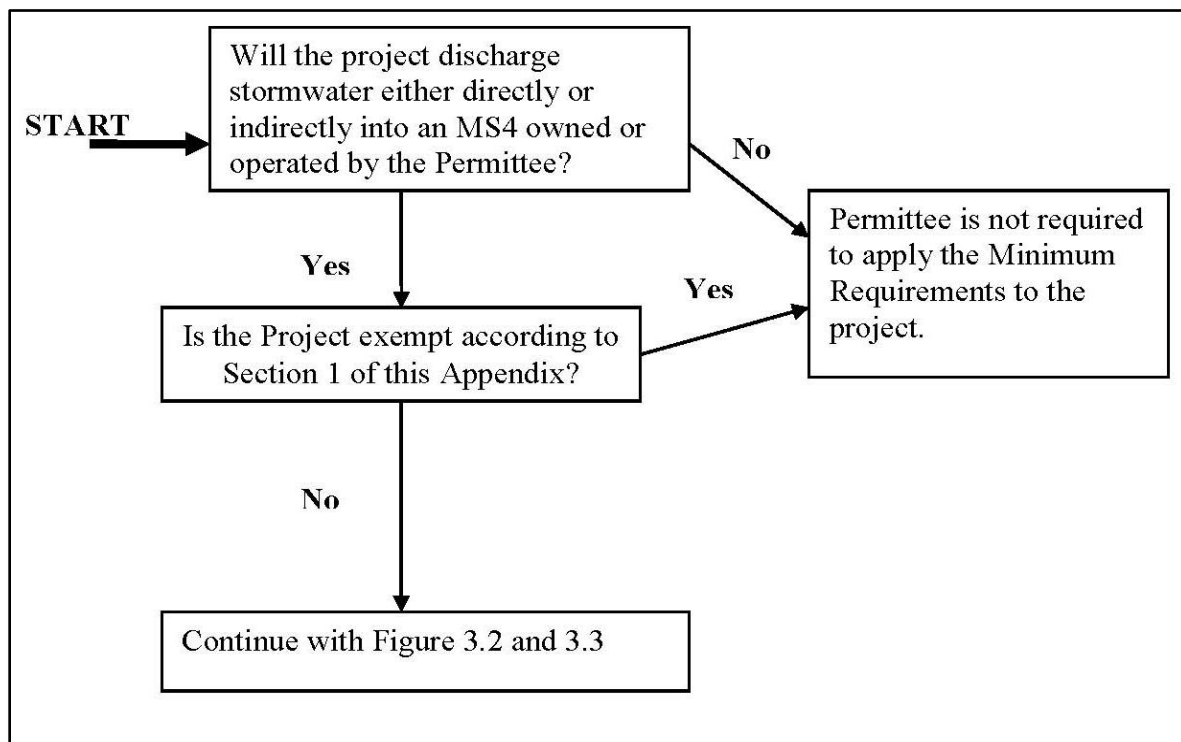


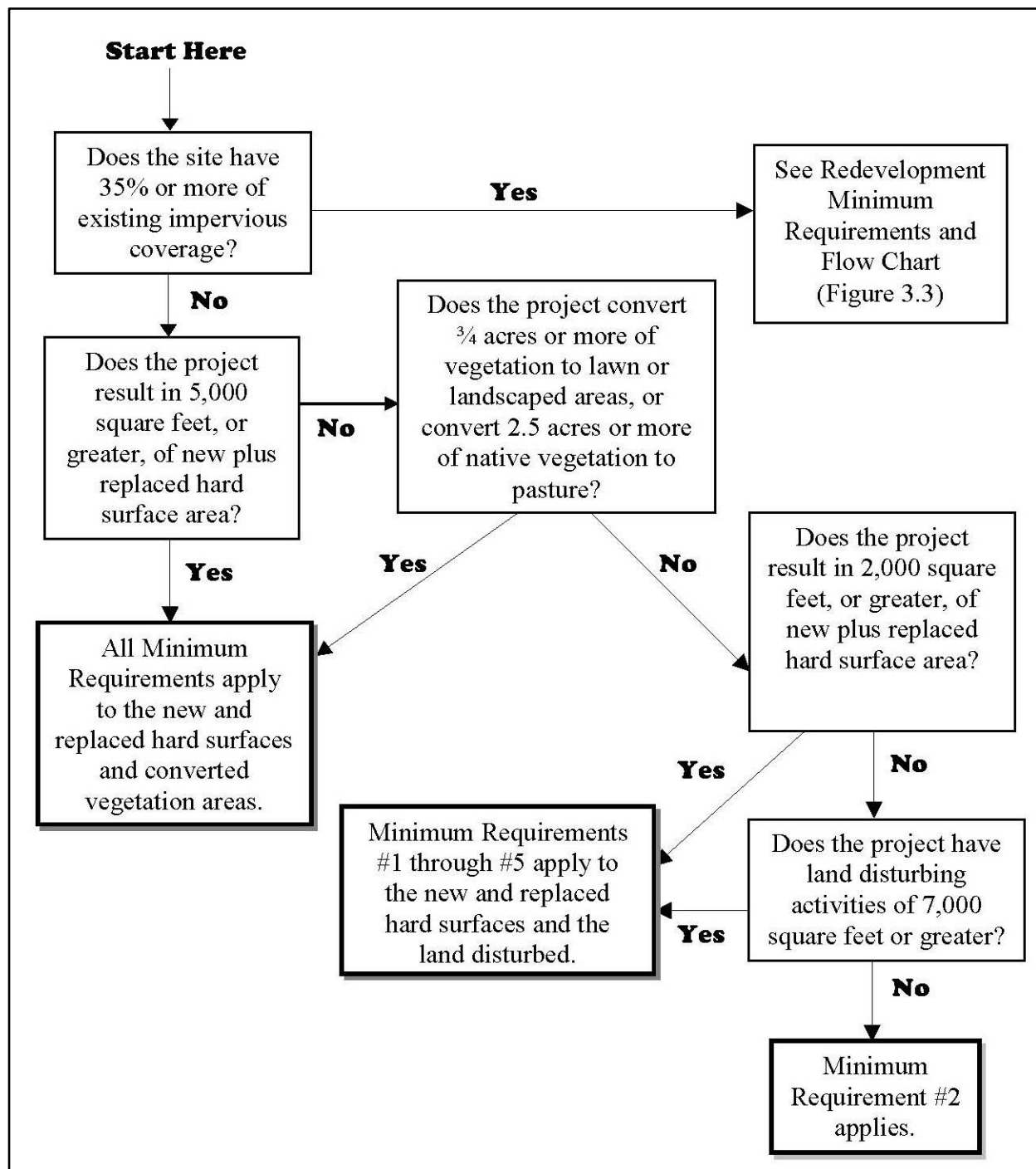
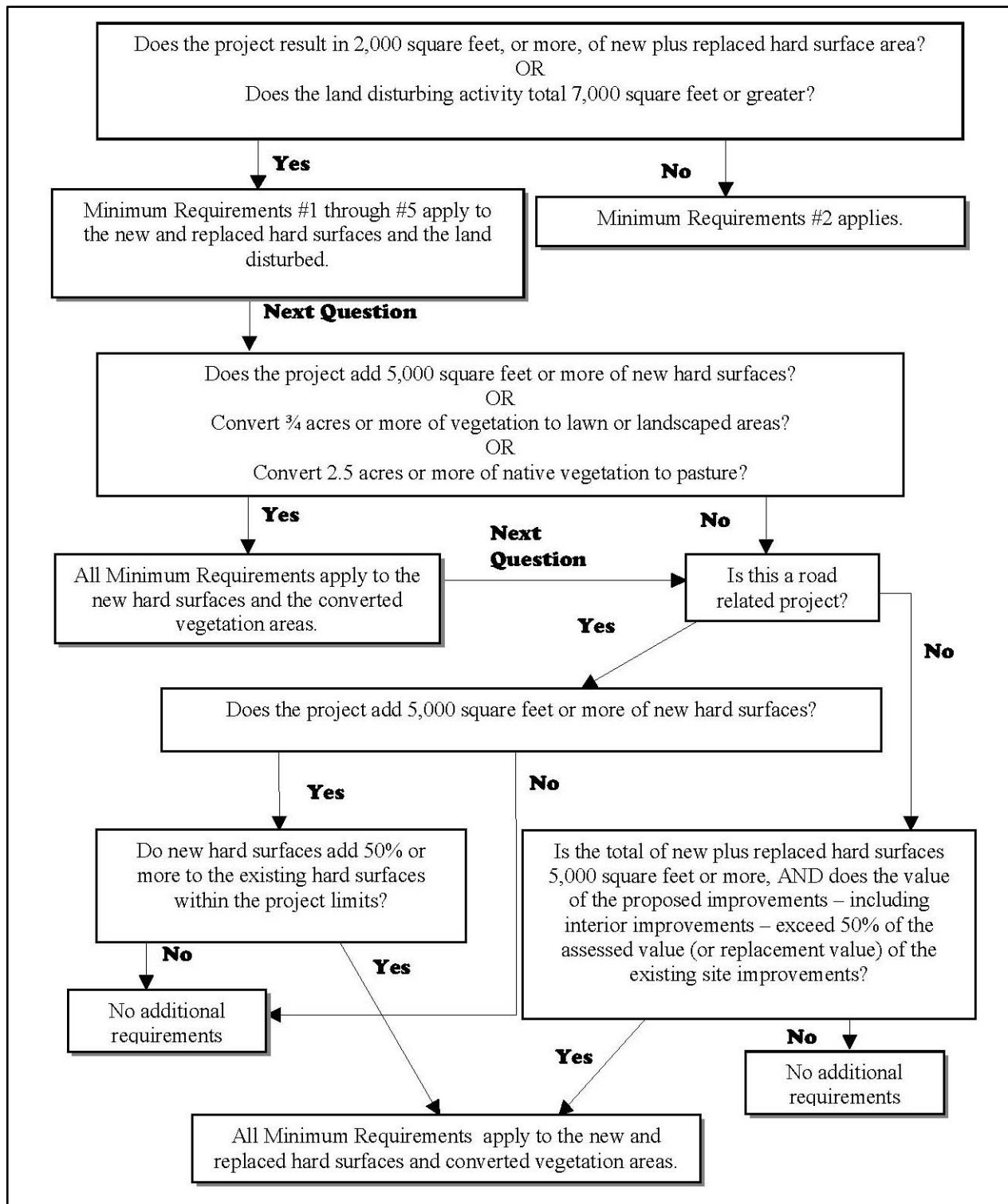
Figure 2.3. Flow Chart for Determining Requirements for New Development

Figure 2.4. Flow Chart for Determining Requirements for Redevelopment**2.3.2 New Development**

All new development shall be required to comply with Minimum Requirement #2.

The following new development shall comply with Minimum Requirements #1 through #5 for the new and replaced hard surfaces and the land disturbed:

- Results in 2,000 square feet, or greater, of new plus replaced hard surface area, or
- Has land disturbing activity of 7,000 square feet or greater.

The following new development shall comply with Minimum Requirements #1 through #9 for the new and replaced hard surfaces and the converted vegetation areas:

- Results in 5,000 square feet, or greater, of new plus replaced hard surface area, or
- Converts $\frac{3}{4}$ acres, or more, of vegetation to lawn or landscaped areas, or
- Converts 2.5 acres, or more, of native vegetation to pasture.

2.3.3 Redevelopment

All redevelopment shall be required to comply with Minimum Requirement #2.

The following redevelopment shall comply with Minimum Requirements #1 through #5 for the new and replaced hard surfaces and the land disturbed:

- Results in 2,000 square feet, or more, of new plus replaced hard surface area, or
- Has land disturbing activity of 7,000 square feet or greater.

The following redevelopment shall comply with Minimum Requirements #1 through #9 for the new hard surfaces and converted vegetation areas:

- Adds 5,000 square feet or more of new hard surfaces or,
- Converts $\frac{3}{4}$ acres, or more, of vegetation to lawn or landscaped areas, or
- Converts 2.5 acres, or more, of native vegetation to pasture.

Economic threshold: other types of redevelopment projects shall comply with Minimum Requirements #1 through #9 for the new and replaced hard surfaces and the converted vegetation areas if the total of new plus replaced hard surfaces is 5,000 square feet or more, and the valuation of proposed improvements – including interior improvements – exceeds 50% of the assessed value of the existing site improvements. (See Figure 2.3).

2.3.4 Transportation Projects

For road-related projects, runoff from the replaced and new hard surfaces (including pavement, shoulders, curbs, and sidewalks) and the converted vegetation areas shall meet all the Minimum Requirements if the new hard surfaces total 5,000 square feet or more and total 50%

or more of the existing hard surfaces within the project limits. The project limits shall be defined by the length of the project and the width of the right-of-way (See Figure 2.3).

The Director may grant a variance/exception to the application of the flow control requirements to replaced impervious surfaces if such application imposes a severe economic hardship. See Section 2.6.

2.3.5 Central Issaquah Area Alternative Flow Control Standard

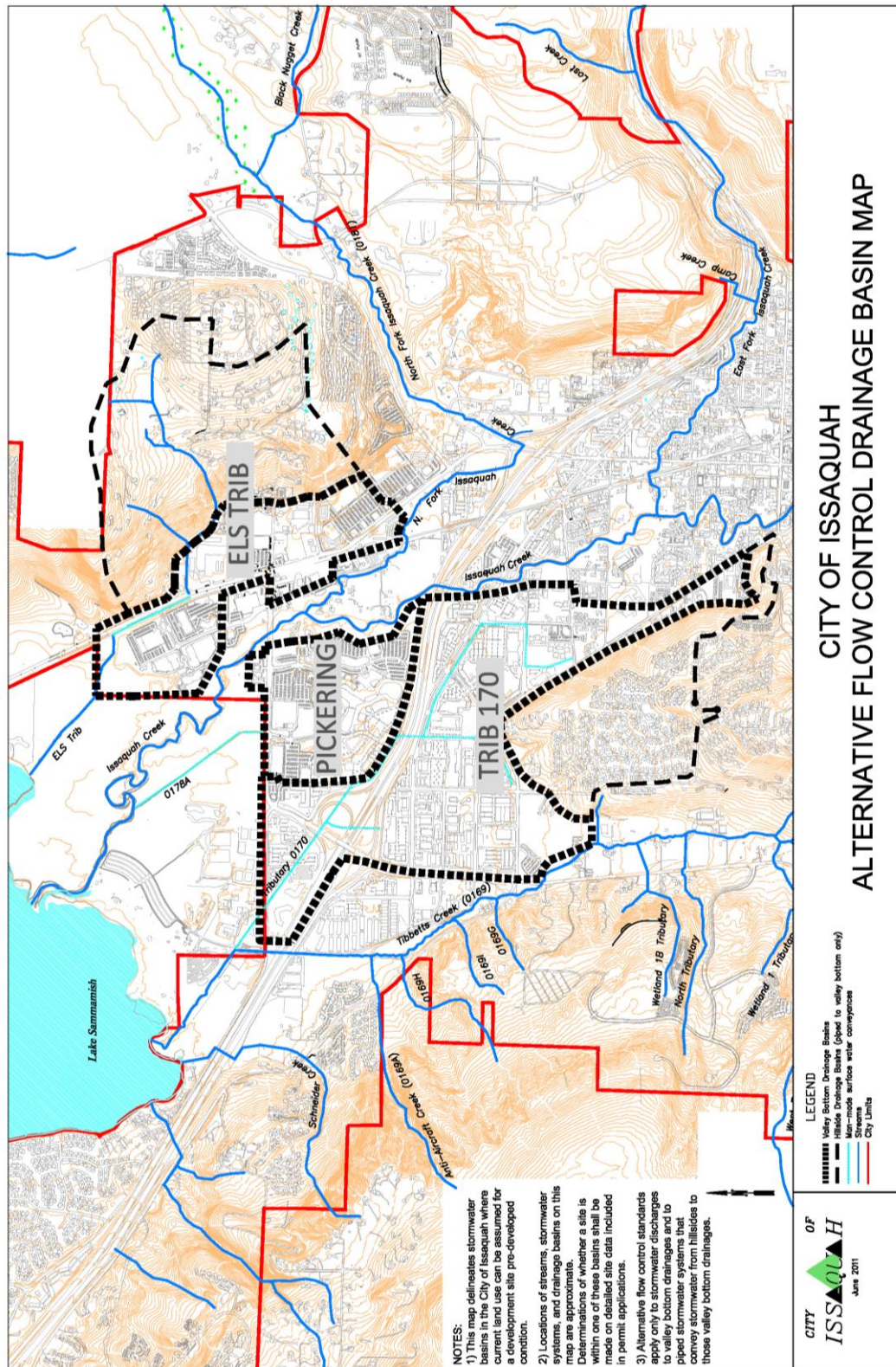
This alternative flow control standard modifies the flow control standard in the valley floor area of downtown Issaquah. In these sub-basins the pre-development condition can be assumed to be existing site conditions instead of forested. Figure 2-5 identifies these subbasins. Projects that incorporate this alternative flow control standard will need to confirm that the project site drains to these sub-basins.

2.3.6 Central Issaquah Area Seasonally Saturated Soil Assumption

The City in 2011 conducted a technical analysis, in coordination with the Department of Ecology, into the pre-development hydrology of this area and specifically where seasonally saturated soil conditions can be documented near the surface (Northwest Hydraulic Consultants 2011). In general, the Ecology's Stormwater Manual specifies that flow control facilities mitigating development and re-development must mimic the runoff characteristics of natural, historical soil conditions (i.e. pre-development hydrology) over a wide range of storm conditions. Ecology staff have further clarified that such pre-development conditions should reflect soils and hydrology that existed prior to first settlement, which occurred in this area in the mid-1800s. That analysis concluded that, historically, soils in valley floor soils do exhibit seasonally saturated conditions as revealed by soil boring logs. For those areas that are seasonally saturated there is sufficient justification of historic high groundwater to use a saturated (i.e., wetland) soil assumption for pre-development analysis.

The seasonally saturated soils assumption is not a blanket adjustment that can be applied to a development project in the absence of site-specific soil data. All project proposals that propose to incorporate a seasonally saturated soil assumption must provide onsite soil log information to confirm this conclusion, following the methods contained in the Northwest Hydraulic Consultants analysis (this memo available through the City's web site or from DSD).

Figure 2-5. Central Issaquah Area Alternative Flow Control Standard Map



2.4 MINIMUM REQUIREMENTS

This Section describes the Minimum Requirements for stormwater management at new development and redevelopment sites. Section 3 of this Appendix should be consulted to determine which of the minimum requirements below apply to any given project. Figures 3.2 and 3.3 should be consulted to determine whether the minimum requirements apply to new surfaces, replaced surfaces, or new and replaced surfaces.

2.4.1 MR#1: Preparation of Stormwater Site Plans

The City requires a Stormwater Site Plan (also termed a Technical Information Report) from all projects meeting the thresholds in Section 2.3 of this Appendix. Stormwater Site Plans shall use site-appropriate development principles, as required and encouraged by local development codes, to retain native vegetation and minimize impervious surfaces to the extent feasible. Stormwater Site Plans shall be prepared in accordance with Chapter 3 of Volume 1 of the *Stormwater Management Manual for Western Washington (SWMMWW)*.

2.4.2 MR#2: Construction Stormwater Pollution Prevention Plan (SWPPP)

Note: To avoid redundant submittals, the City will allow compliance with this Minimum Requirement for an individual site through Ecology's *General NPDES Permit for Stormwater Discharges Associated with Construction Activities*. Documentation of Ecology's stormwater general permit compliance must be supplied with the City permit application.

2.4.2.1 Thresholds

All new development and redevelopment projects are responsible for preventing erosion and discharge of sediment and other pollutants into receiving waters.

Projects which result in 2,000 sq. ft. or more of new plus replaced hard surface area, or which disturb 7,000 sq. ft. or more of land must prepare a SWPPP as part of the Stormwater Site Plan.

Projects below those thresholds are not required to prepare a Construction SWPPP, but must consider all of the Elements listed below for Construction SWPPPs and develop controls for all elements that pertain to the project site.

2.4.2.2 General Requirements

The SWPPP shall include a narrative and drawings. All BMPs shall be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative shall include documentation to explain and justify the pollution prevention decisions made for the project. Each of the thirteen elements listed below must be considered and included in the SWPPP unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the narrative of the SWPPP.

Clearing and grading activities for developments shall be permitted only if conducted pursuant to an approved site development plan (e.g., subdivision approval) that establishes permitted areas of clearing, grading, cutting, and filling. These permitted clearing and grading areas and any other areas required to preserve critical or sensitive areas, buffers, native growth protection easements, or tree retention areas shall be delineated on the site plans and the development site.

The SWPPP shall be implemented beginning with initial land disturbance and until final stabilization. Sediment and Erosion control BMPs shall be consistent with the BMPs contained in chapter 4 of Volume II of the *Stormwater Management Manual for Western Washington* (SWMMWW).

Seasonal Work Limitations - From October 1 through April 30, clearing, grading, and other soil disturbing activities may only be authorized if silt-laden runoff will be prevented from leaving the site through a combination of the following:

1. Site conditions including existing vegetative coverage, slope, soil type and proximity to receiving waters; and
2. Limitations on activities and the extent of disturbed areas; and
3. Proposed erosion and sediment control measures.

Based on the information provided and/or local weather conditions, the City may expand or restrict the seasonal limitation on site disturbance. The following activities are exempt from the seasonal clearing and grading limitations:

1. Routine maintenance and necessary repair of erosion and sediment control BMPs,
2. Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil, and
3. Activities where there is one hundred percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

2.4.2.3 Construction Stormwater Pollution Prevention Plan (SWPPP) Elements

1. Preserve Vegetation/Mark Clearing Limits:

- a. Before beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.
- b. Retain the duff layer, native top soil, and natural vegetation in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access:

- a. Limit construction vehicle access and exit to one route, if possible.
- b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking of sediment onto public roads.
- c. Locate wheel wash or tire baths on-site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.
- d. If sediment is tracked off site, clean the affected roadways thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pick up and transport the sediment to a controlled sediment disposal area.
- e. Conduct street washing only after sediment is removed in accordance with 2.d, above.
- f. Control street wash wastewater by pumping back on-site, or otherwise prevent it from discharging into systems tributary to waters of the State.

3. Control Flow Rates:

- a. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site.
- b. Where necessary to comply with 3.a, above, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (e.g., impervious surfaces).
- c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

4. Install Sediment Controls:

1. Design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants.
2. Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the

first steps in grading. These BMPs shall be functional before other land disturbing activities take place.

3. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.
4. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard in 3.a, above.
5. Locate BMPs intended to trap sediment on-site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
6. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils:

- a. Stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base early on areas to be paved, and dust control.
- b. Control stormwater volume and velocity within the site to minimize soil erosion.
- c. Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.
- d. Soils must not remain exposed and unworked for more than the time periods set forth below to prevent erosion:
 - During the dry season (May 1 – September 30): 7 days
 - During the wet season (October 1 – April 30): 2 days
- e. Stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
- f. Stabilize soil stockpiles from erosion, protect with sediment trapping measures, and where possible, locate away from storm drain inlets, waterways and drainage channels.

- g. Minimize the amount of soil exposed during construction activity.
- h. Minimize the disturbance of steep slopes.
- i. Minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes:

- a. Design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).
- b. Divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.
- c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.
 - Temporary pipe slope drains must handle the peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model to predict flows, bare soil areas should be modeled as “landscaped area.”
- d. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.
- e. Place check dams at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets:

- a. Protect storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.
- b. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets:

- a. Design, construct, and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:

- Channels must handle the peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model to predict flows, bare soil areas should be modeled as “landscaped area.”
- b. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.

9. Control Pollutants:

- a. Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants.
- b. Handle and dispose all pollutants, including waste materials and demolition debris that occur on-site in a manner that does not cause contamination of stormwater.
- c. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.
- d. Conduct maintenance, fueling and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.
- e. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland application, or to the sanitary sewer, with local sewer district approval.
- f. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers’ label requirements for application rates and procedures.
- g. Use BMPs to prevent contamination of stormwater runoff by pH modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters.

- h. Adjust the pH of stormwater if necessary to prevent violations of water quality standards.
- i. Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete on-site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.
- j. Obtain written approval from Ecology before using chemical treatment other than CO₂ or dry ice to adjust pH.

10. Control De-Watering:

- a. Discharge foundation, vault, and trench de-watering water, which have similar characteristics to stormwater runoff at the site, into a controlled conveyance system before discharge to a sediment trap or sediment pond.
- b. Discharge clean, non-turbid de-watering water, such as well-point ground water, to systems tributary to, or directly into surface waters of the State, as specified in 8, above, provided the de-watering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that “surface waters of the State” may exist on a construction site as well as off site; for example, a creek running through a site.
- c. Handle highly turbid or otherwise contaminated dewatering water separately from stormwater.
- d. Other treatment or disposal options may include:
 - (i) Infiltration
 - (ii) Transport off-site in vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.
 - (iii) Ecology-approved on-site chemical treatment or other suitable treatment technologies.
 - (iv) Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.
 - (v) Use of a sedimentation bag that discharges to a ditch or swale for small volumes of localized dewatering.

11. Maintain BMPs:

- a. Maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.
- b. Remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project:

- a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.
- b. Inspection and monitoring – Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function.
- c. Maintaining an updated construction SWPPP – Maintain, update, and implement the SWPPP.
- d. Projects that disturb one or more acres must have site inspections conducted by a Certified Erosion and Sediment Control Lead (CESCL). Project sites disturbing less than one acre may have a CESCL or a person without CESCL certification conduct inspections. By the initiation of construction, the SWPPP must identify the CESCL or inspector, who must be present on-site or on-call at all times.

13. Protect Low Impact Development BMPs

- a. Protect all Bioretention and Rain Garden BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden BMPs. Restore the BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden Bioretention/rain garden soils, and replacing the removed soils with soils meeting the design specification.
- b. Prevent compacting Bioretention and Rain Garden BMPs by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- c. Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements or base materials.
- d. Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from the local stormwater manual or the manufacturer's procedures.
- e. Keep all heavy equipment off existing soils under LID BMPs that have been excavated to final grade to retain the infiltration rate of the soils.

2.4.3 MR#3: Source Control of Pollution

All known, available and reasonable source control BMPs must be applied to all projects. Source control BMPs must be selected, designed, and maintained in accordance with Volume IV of the *Stormwater Management Manual for Western Washington*.

2.4.4 MR#4: Preservation of Natural Drainage Systems and Outfalls

Natural drainage patterns shall be maintained, and discharges from the project site shall occur at the natural location, to the maximum extent practicable. The manner by which runoff is discharged from the project site must not cause a significant adverse impact to downstream receiving waters and down gradient properties. All outfalls require energy dissipation.

2.4.5 MR#5: On-Site Stormwater Management

2.4.5.1 *Applicability*

Except as provided below, projects shall employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the extent feasible without causing flooding or erosion impacts.

Projects qualifying as flow control exempt in accordance with Section 4.7 of this Appendix do not have to achieve the LID performance standard, nor consider bioretention, rain gardens, permeable pavement, and full dispersion if using List #1 or List #2. However, those projects must implement BMP T5.13; BMPs T5.10A, B, or C; and BMP T5.11 or T5.12, if feasible.

2.4.5.2 *Project Thresholds*

1. Projects triggering only Minimum Requirements #1 through #5 shall either:
 - a. Use On-site Stormwater Management BMPs from List #1 for all surfaces within each type of surface in List #1; or
 - b. Demonstrate compliance with the LID Performance Standard. Projects selecting this option cannot use Rain Gardens. They may choose to use Bioretention BMPs as described in the *SWMMWW* (optional).
2. Projects triggering Minimum Requirements #1 through #9 shall either:
 - a. Use On-site Stormwater Management BMPs from List #2; or
 - b. Demonstrate compliance with the LID Performance Standard and BMP T5.13 (optional).

Note: the LID Performance Standard is only required for projects located outside of the Urban Growth Area. No locations in Issaquah fall into that requirement since Issaquah is entirely within the UGA. However, projects can voluntarily adopt that standard and therefore it is identified as optional.

2.4.5.3 *Low Impact Development Performance Standard (optional)*

Stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 8% of the 2-year peak flow to 50% of the 2-year peak flow. Refer to the Standard Flow Control Requirement section in Minimum Requirement #7 for information about the assignment of the pre-developed condition. Project sites that must also meet minimum requirement #7 shall match flow durations between 8% of the 2-year flow through the full 50-year flow.

2.4.5.4 List #1: On-site Stormwater Management BMPs for Projects Triggering Minimum Requirements #1 through #5

For each surface, consider the BMP's in the order listed for that type of surface. Use the first BMP that is considered feasible. No other On-site Stormwater Management BMP is necessary for that surface. Feasibility shall be determined by evaluation against:

1. Design criteria, limitations, and infeasibility criteria identified for each BMP in the *SWMMWW*; and
2. Competing Needs Criteria listed in Chapter 5 of Volume V of the *SWMMWW*.

Lawn and landscaped areas:

1. Post-Construction Soil Quality and Depth in accordance with BMP T5.13 in Chapter 5 of Volume V of the *SWMMWW*

Roofs:

1. Full Dispersion in accordance with BMP T5.30 in Chapter 5 of Volume V of the *SWMMWW*, or Downspout Full Infiltration Systems in accordance with BMP T5.10A in Section 3.1.1 of Volume III of the *SWMMWW*.
2. Rain Gardens in accordance with BMP T5.14A in Chapter 5 of Volume V, or Bioretention in accordance with Chapter 7 of Volume V of the *SWMMWW*. The rain garden or bioretention facility must have a minimum horizontal projected surface area below the overflow which is at least 5% of the area draining to it.
3. Downspout Dispersion Systems in accordance with BMP T5.10B in Section 3.1.2 of Volume III of the *SWMMWW*.
4. Perforated Stub-out Connections in accordance with BMP T5.10C in Section 3.1.3 of Volume III of the *SWMMWW*.

Other Hard Surfaces:

1. Full Dispersion in accordance with BMP T5.30 in Chapter 5 of Volume V of the *SWMMWW*.
2. Permeable pavement² in accordance with BMP T5.15 in Chapter 5 of Volume V of the *SWMMWW*, or Rain Gardens in accordance with BMP T5.14A in Chapter 5 of Volume V,

or Bioretention in accordance with Chapter 7 of Volume V of the *SWMMWW*. The rain garden or bioretention facility must have a minimum horizontal projected surface area below the overflow which is at least 5% of the area draining to it.

3. Sheet Flow Dispersion in accordance with BMP T5.12, or Concentrated Flow Dispersion in accordance with BMP T5.11 in Chapter 5 of Volume V of the *SWMMWW*.

² This is not a requirement to pave these surfaces. Where pavement is proposed, it must be permeable to the extent feasible unless full dispersion is employed.

2.4.5.5 List #2: On-site Stormwater Management BMPs for Projects Triggering Minimum Requirements #1 through #9

For each surface, consider the BMPs in the order listed for that type of surface. Use the first BMP that is considered feasible. No other On-site Stormwater Management BMP is necessary for that surface. Feasibility shall be determined by evaluation against:

1. Design criteria, limitations, and infeasibility criteria identified for each BMP in the *SWMMWW*; and
2. Competing Needs Criteria listed in Chapter 5 of Volume V of the *SWMMWW*.

Lawn and landscaped areas:

1. Post-Construction Soil Quality and Depth in accordance with BMP T5.13 in Chapter 5 of Volume V of the *SWMMWW*

Roofs:

1. Full Dispersion in accordance with BMP T5.30 in Chapter 5 of Volume V of the *SWMMWW*, or Downspout Full Infiltration Systems in accordance with BMP T5.10A in Section 3.1.1 of Volume III of the *SWMMWW*
2. Bioretention (See Chapter 7 of Volume V of the *SWMMWW*) facilities that have a minimum horizontally projected surface area below the overflow which is at least 5% of the of the total surface area draining to it
3. Downspout Dispersion Systems in accordance with BMP T5.10B in Section 3.1.2 of Volume III of the *SWMMWW*
4. Perforated Stub-out Connections in accordance with BMP T5.10C in Section 3.1.3 of Volume III of the *SWMMWW*.

Other Hard Surfaces:

3. Full Dispersion in accordance with BMP T5.30 in Chapter 5 of Volume V of the *SWMMWW*
4. Permeable pavement² in accordance with BMP T5.15 in Chapter 5 of Volume V of the *SWMMWW*

5. Bioretention (See Chapter 7, Volume V of the *SWMMWW*) facilities that have a minimum horizontally projected surface area below the overflow which is at least 5% of the total surface area draining to it.
6. Sheet Flow Dispersion in accordance with BMP T5.12, or Concentrated Flow Dispersion in accordance with BMP T5.11 in Chapter 5 of Volume V of the *SWMMWW*

2.4.6 MR#6: Runoff Treatment

2.4.6.1 Project Thresholds

When assessing a project against the following thresholds, only consider those hard and pervious surfaces that are subject to this minimum requirement as determined in Section 2.3.

The following require construction of stormwater treatment facilities:

- Projects in which the total of pollution-generating hard surface (PGHS) is 5,000 square feet or more in a threshold discharge area of the project, or
- Projects in which the total of pollution-generating pervious surfaces (PGPS) – not including permeable pavements - is three-quarters (3/4) of an acre or more in a threshold discharge area, and from which there will be a surface discharge in a natural or man-made conveyance system from the site.

2.4.6.2 Treatment-Type Thresholds

1. Oil Control

Treatment to achieve Oil Control applies to projects that have “high-use sites.” High-use sites are those that typically generate high concentrations of oil due to high traffic turnover or the frequent transfer of oil. High-use sites include:

- a. An area of a commercial or industrial site subject to an expected average daily traffic (ADT) count equal to or greater than 100 vehicles per 1,000 square feet of gross building area;
- b. An area of a commercial or industrial site subject to petroleum storage and transfer in excess of 1,500 gallons per year, not including routinely delivered heating oil;
- c. An area of a commercial or industrial site subject to parking, storage or maintenance of 25 or more vehicles that are over 10 tons gross weight (trucks, buses, trains, heavy equipment, etc.);
- d. A road intersection with a measured ADT count of 25,000 vehicles or more on the main roadway and 15,000 vehicles or more on any intersecting roadway, excluding projects proposing primarily pedestrian or bicycle use improvements.

2. Phosphorus Treatment

The City of Issaquah adopts the Phosphorus Treatment Standard for all stormwater discharging to surface water. Discharge to groundwater outside of the ¼-mile boundary with Lake Sammamish is exempt.

3. Enhanced Treatment

Except where specified below under “4. Basic Treatment”, Enhanced treatment for reduction in dissolved metals is required for the following project sites that: 1) discharge directly to fresh waters or conveyance systems tributary to fresh waters designated for aquatic life use or that have an existing aquatic life use; or 2) use infiltration strictly for flow control – not treatment – and the discharge is within ¼ mile of a fresh water designated for aquatic life use or that has an existing aquatic life use:

- a. Industrial project sites,
- b. Commercial project sites,
- c. Multi-family project sites, and
- d. High AADT roads as follows:
 - Fully controlled and partially controlled limited access highways with Annual Average Daily Traffic (AADT) counts of 15,000 or more
 - All other roads with an AADT of 7,500 or greater
 - Outside of Urban Growth Management Areas:
 - Roads with an AADT of 15,000 or greater unless discharging to a 4th Strahler order stream or larger;
 - Roads with an AADT of 30,000 or greater if discharging to a 4th Strahler order stream or larger (as determined using 1:24,000 scale maps to delineate stream order).

Any areas of the above-listed project sites that are identified as subject to Basic Treatment requirements (below), are not also subject to Enhanced Treatment requirements. For developments with a mix of land use types, the Enhanced Treatment requirement shall apply when the runoff from the areas subject to the Enhanced Treatment requirement comprise 50% or more of the total runoff within a threshold discharge area.

4. Basic Treatment:

Basic Treatment is required in the following circumstances:

- Project sites that discharge to the ground, UNLESS:
 - 1) The soil suitability criteria for infiltration treatment are met (See Chapter 3, Volume III of the *SWMMWW*), and alternative pretreatment is provided (see Chapter 6, Volume V

of the *SWMMWW*); or

2) The project site uses infiltration strictly for flow control – not treatment - and the discharge is within ¼-mile of a phosphorus sensitive lake (use a Phosphorus Treatment facility), or

3) The project site is industrial, commercial, multi-family residential, or a high AADT road (consistent with the Enhanced Treatment-type thresholds listed above) and is within ¼ mile of a fresh water designated for aquatic life use or that has an existing aquatic life use.(use an Enhanced Treatment facility).

- Residential projects not otherwise needing phosphorus control as designated by USEPA, the Department of Ecology, or by the Permittee;
- Project sites discharging directly (or indirectly through a municipal separate storm sewer system) to Basic Treatment Receiving Waters (Appendix I-C of the *SWMMWW*);
- Project sites that drain to fresh water that is not designated for aquatic life use, and does not have an existing aquatic life use; and project sites that drain to waters not tributary to waters designated for aquatic life use or that have an existing aquatic life use;
- Landscaped areas of industrial, commercial, and multi-family project sites, and parking lots of industrial and commercial project sites that do not involve pollution-generating sources (e.g., industrial activities, customer parking, storage of erodible or leachable material, wastes or chemicals) other than parking of employees' private vehicles. For developments with a mix of land use types, the Basic Treatment requirement shall apply when the runoff from the areas subject to the Basic Treatment requirement comprise 50% or more of the total runoff within a threshold discharge area.

2.4.6.3 Treatment Facility Sizing

Size stormwater treatment facilities for the entire area that drains to them, even if some of those areas are not pollution-generating, or were not included in the project site threshold decisions (Section 3 of this appendix) or the treatment threshold decisions of this minimum requirement.

Water Quality Design Storm Volume

The volume of runoff predicted from a 24-hour storm with a 6-month return frequency (a.k.a., 6-month, 24-hour storm). Wetpool facilities are sized based upon the volume of runoff predicted through use of the Natural Resource Conservation Service curve number equations in Chapter 2 of Volume III of the *SWMMWW*), for the 6-month, 24-hour storm. Alternatively, when using an approved continuous runoff model, the water quality design storm volume shall be equal to the simulated daily volume that represents the upper limit of the range of daily

volumes that accounts for 91% of the entire runoff volume over a multi-decade period of record.

Water Quality Design Flow Rate

1. Preceding Detention Facilities or when Detention Facilities are not required:

The flow rate at or below which 91% of the runoff volume, as estimated by an approved continuous runoff model, will be treated. Design criteria for treatment facilities are assigned to achieve the applicable performance goal (e.g., 80% TSS removal) at the water quality design flow rate. At a minimum, 91% of the total runoff volume, as estimated by an approved continuous runoff model, must pass through the treatment facility(ies) at or below the approved hydraulic loading rate for the facility(ies).

2. Downstream of Detention Facilities:

The water quality design flow rate must be the full 2-year release rate from the detention facility.

Treatment Facility Selection, Design, and Maintenance

Stormwater treatment facilities shall be:

2. Selected in accordance with the process identified in Chapter 4 of Volume I, and Chapter 2 of Volume V of the *SWMMWW*,
- Designed in accordance with the design criteria in Volume V of the *SWMMWW*, and
- Maintained in accordance with the maintenance schedule in Volume V of the *SWMMWW*.

2.4.6.4 Additional Requirements

The discharge of untreated stormwater from pollution-generating hard surfaces to ground water must not be authorized by the Permittee, except for the discharge achieved by infiltration or dispersion of runoff through use of On-site Stormwater Management BMPs in accordance with Chapter 5, Volume V and Chapter 7, Volume V of the *SWMMWW*; or by infiltration through soils meeting the soil suitability criteria in Chapter 3 of Volume III of the *SWMMWW*.

2.4.7 MR#7: Flow Control

2.4.7.1 Applicability

Except as provided below, projects must provide flow control to reduce the impacts of stormwater runoff from hard surfaces and land cover conversions. The requirement below applies to projects that discharge stormwater directly, or indirectly through a conveyance system, into a fresh water body.

Flow control is not required for projects that discharge directly to, or indirectly through an MS4 to a water listed in Appendix I-E of the *SWMMWW* subject to the following restrictions:

- Direct discharge to the exempt receiving water does not result in the diversion of drainage from any perennial stream classified as Types 1, 2, 3, or 4 in the State of Washington Interim Water Typing System, or Types “S”, “F”, or “Np” in the Permanent Water Typing System, or from any category I, II, or III wetland; and
- Flow splitting devices or drainage BMP’s are applied to route natural runoff volumes from the project site to any downstream Type 5 stream or category IV wetland:
 - Design of flow splitting devices or drainage BMP’s will be based on continuous hydrologic modeling analysis. The design will assure that flows delivered to Type 5 stream reaches will approximate, but in no case exceed, durations ranging from 50% of the 2-year to the 50-year peak flow.
 - Flow splitting devices or drainage BMP’s that deliver flow to category IV wetlands will also be designed using continuous hydrologic modeling to preserve pre-project wetland hydrologic conditions unless specifically waived or exempted by regulatory agencies with permitting jurisdiction; and
- The project site must be drained by a conveyance system that is comprised entirely of manmade conveyance elements (e.g., pipes, ditches, outfall protection) and extends to the ordinary high water line of the exempt receiving water; and
- The conveyance system between the project site and the exempt receiving water shall have sufficient hydraulic capacity to convey discharges from future build-out conditions (under current zoning) of the site, and the existing condition from non-project areas from which runoff is or will be collected; and
- Any erodible elements of the manmade conveyance system must be adequately stabilized to prevent erosion under the conditions noted above.

If the discharge is to a stream that leads to a wetland, or to a wetland that has an outflow to a stream, both this minimum requirement (Minimum Requirement #7) and Minimum Requirement #8 apply.

2.4.7.2 Thresholds

When assessing a project against the following thresholds, consider only those impervious, hard, and pervious surfaces that are subject to this minimum requirement as determined in Section 2.3.

The following circumstances require achievement of the standard flow control requirement for western Washington:

- Projects in which the total of effective impervious surfaces is 10,000 square feet or more in a threshold discharge area, or
- Projects that convert $\frac{3}{4}$ acres or more of vegetation to lawn or landscape, or convert 2.5 acres or more of native vegetation to pasture in a threshold discharge area, and from which there is a surface discharge in a natural or man-made conveyance system from the site, or
- Projects that through a combination of hard surfaces and converted vegetation areas cause a 0.10 cubic feet per second (cfs) increase or greater in the 100-year flow frequency from a threshold discharge area as estimated using the Western Washington Hydrology Model or other approved model and one-hour time steps (or a 0.15 cfs increase or greater using 15-minute time steps). Washington Hydrology Model or other approved model and one-hour time steps (or a 0.15 cfs increase or greater using 15-minute time steps). Washington Hydrology Model or other approved model and one-hour time steps (or a 0.15 cfs increase or greater using 15-minute time steps).

The 0.10 cfs (one-hour time steps) or 0.15 cfs (15-minute time steps) increase should be a comparison of the post-project runoff to the existing condition runoff. For the purpose of applying this threshold, the existing condition is either the pre-project land cover, or the land cover that existed at the site as of a date when the local jurisdiction first adopted flow control requirements into code or rules.

2.4.7.3 *Standard Flow Control Requirement*

Stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. The pre-developed condition to be matched shall be a forested land cover unless:

- Reasonable, historic information is available that indicates the site was prairie prior to settlement (modeled as “pasture” in the Western Washington Hydrology Model); or
- The Central Issaquah Alternative Flow Control Standard applies (see Section 2.2.5); or
- This standard requirement is waived for sites that will reliably infiltrate all the runoff from hard surfaces and converted vegetation areas.

2.4.7.4 Additional Requirement

Flow Control BMPs shall be selected, designed, and maintained in accordance with Volume III of the *SWMMWW* or an approved equivalent.

2.4.8 MR#8: Wetlands Protection

2.4.8.1 Applicability

The requirements below apply only to projects whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system.

2.4.8.2 Thresholds

The thresholds identified in Minimum Requirement #6 – Runoff Treatment, and Minimum Requirement #7 – Flow Control shall also be applied to determine the applicability of this requirement to discharges to wetlands.

2.4.8.3 Standard Requirement

Projects shall comply with Guide Sheets #1 through #3 in Appendix I-D of the *SWMMWW*. The hydrologic analysis shall use the existing land cover condition to determine the existing hydrologic conditions unless directed otherwise by a regulatory agency with jurisdiction.

2.4.8.4 Additional Requirements

Stormwater treatment and flow control facilities shall not be built within a natural vegetated buffer, except for:

- Necessary conveyance systems as approved by the Permittee; or
- As allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guide Sheet 2 in Appendix I-D of the *SWMMWW*.

2.4.9 MR#9: Operation and Maintenance

An operation and maintenance manual that is consistent with the provisions in Volume V of the *SWMMWW* shall be provided for proposed stormwater facilities and BMPs. The party (or parties) responsible for maintenance and operation shall be identified in the operation and maintenance manual. For private facilities a copy of the operation and maintenance manual shall be retained on-site or within reasonable access to the site, and shall be transferred with

the property to the new owner. A log of maintenance activity that indicates what actions were taken shall be kept and be available for inspection by the local government.